Service manual
Fitweld 300

Version 1.2

KEMPPI
The Joy of Welding

Technical data

Supply voltage		3~400 V -15%/+10%, 50 / 60 Hz
Rated power	MIG	Max. 11 kVA
Load capacity 40 °C	ED 20% ED 40% ED 60% ED 100%	300 A / 29 V 220 A / 25 V 180 A / 23 V 140 A / 21 V
Welding range	MIG	20 A / 11 V – 300 A / 32 V
Connection cable / fuse		4 x 1,5 mm² (5 m) / 10 A delayed
Open circuit voltage		43 V
Power ratio at max. Current	MIG	0,95
Efficiency at max. current	MIG	0,85
Spool, max ø		200mm
External dimensions (L x W x H)		457 x 226 x 339 mm
Weight		14,5 Kg
Filler wires	Fe solid Fe cored Ss Al	0,8 – 1,2 mm 0,8 – 1,2 mm 0,8 – 1,2 mm 1,0 – 1,2 mm

The device may be repaired only by a person legally authorized perform electric work!

User interface

Front Plate

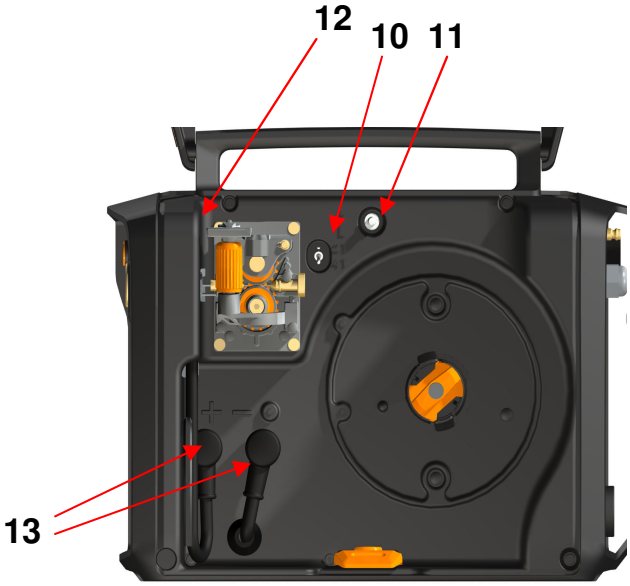
1. Welding voltage adjustment
2. Wire feeding adjustment
3. ON signal lamp
4. Overheat protection lamp
5. No gas warning lamp
6. Euro connector

Back Plate

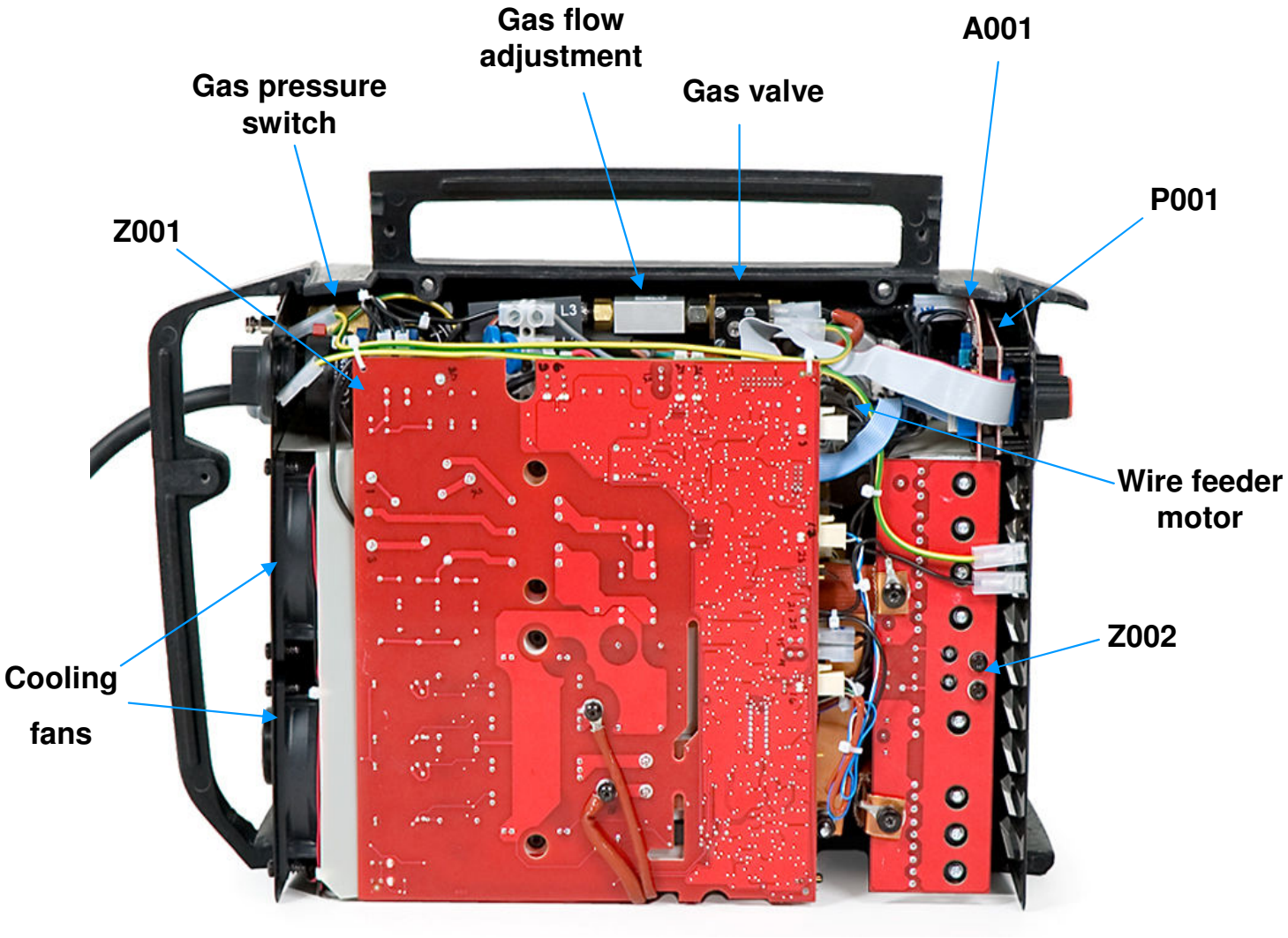
7. Gas connector
8. Main switch
9. Ground cable connector

Spool room

10. 2T no gas/2T/4T switch
11. Gas flow adjustment
12. Spool room light
13. Polarity selection



Construction



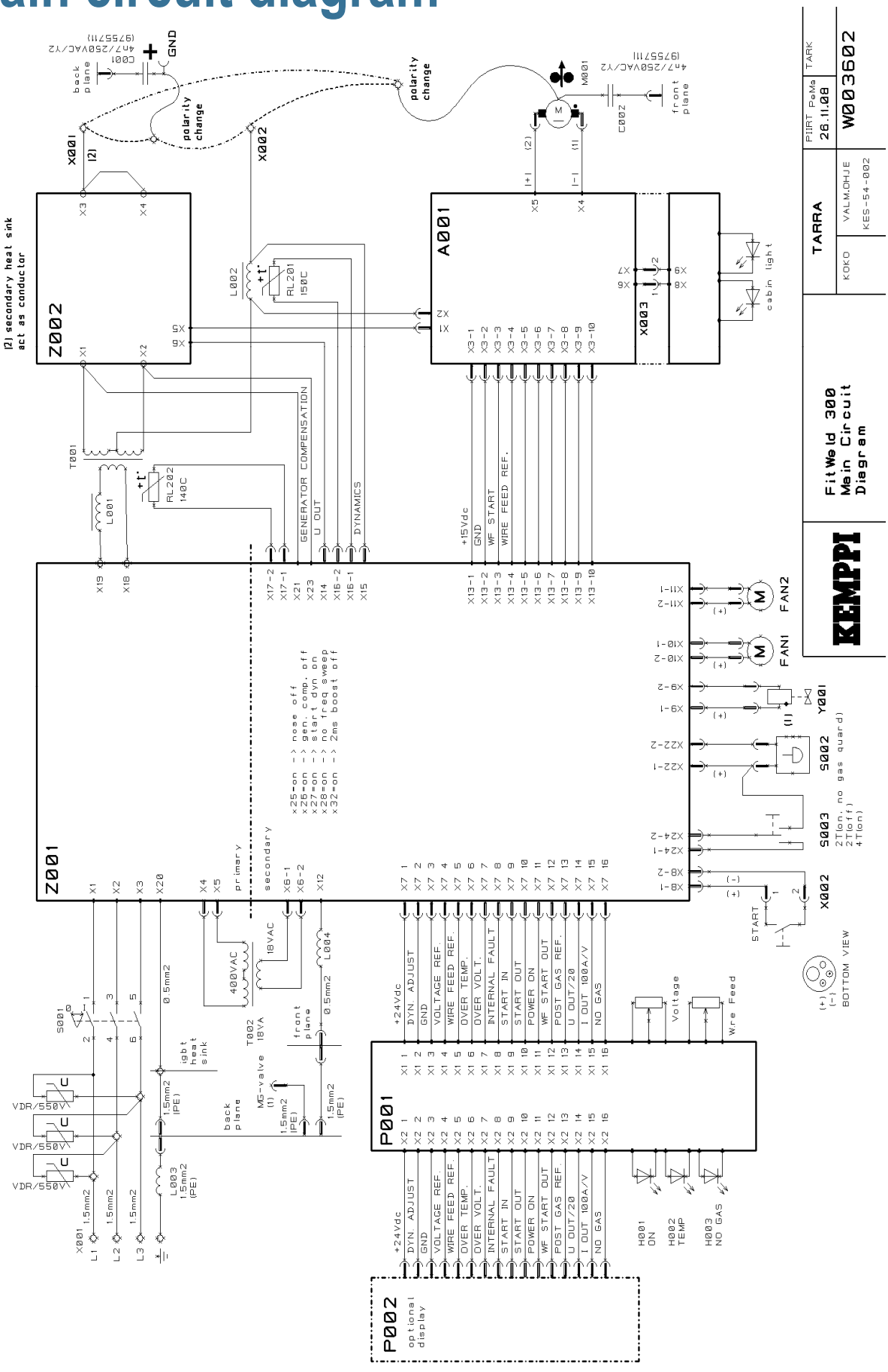
Tip

If machines cover plate screws thread fails you could change PT screws diameter to 5,5mm - 6mm.

Note!

Protective earth conductivity test must be performed at earth points on both the front and back plates

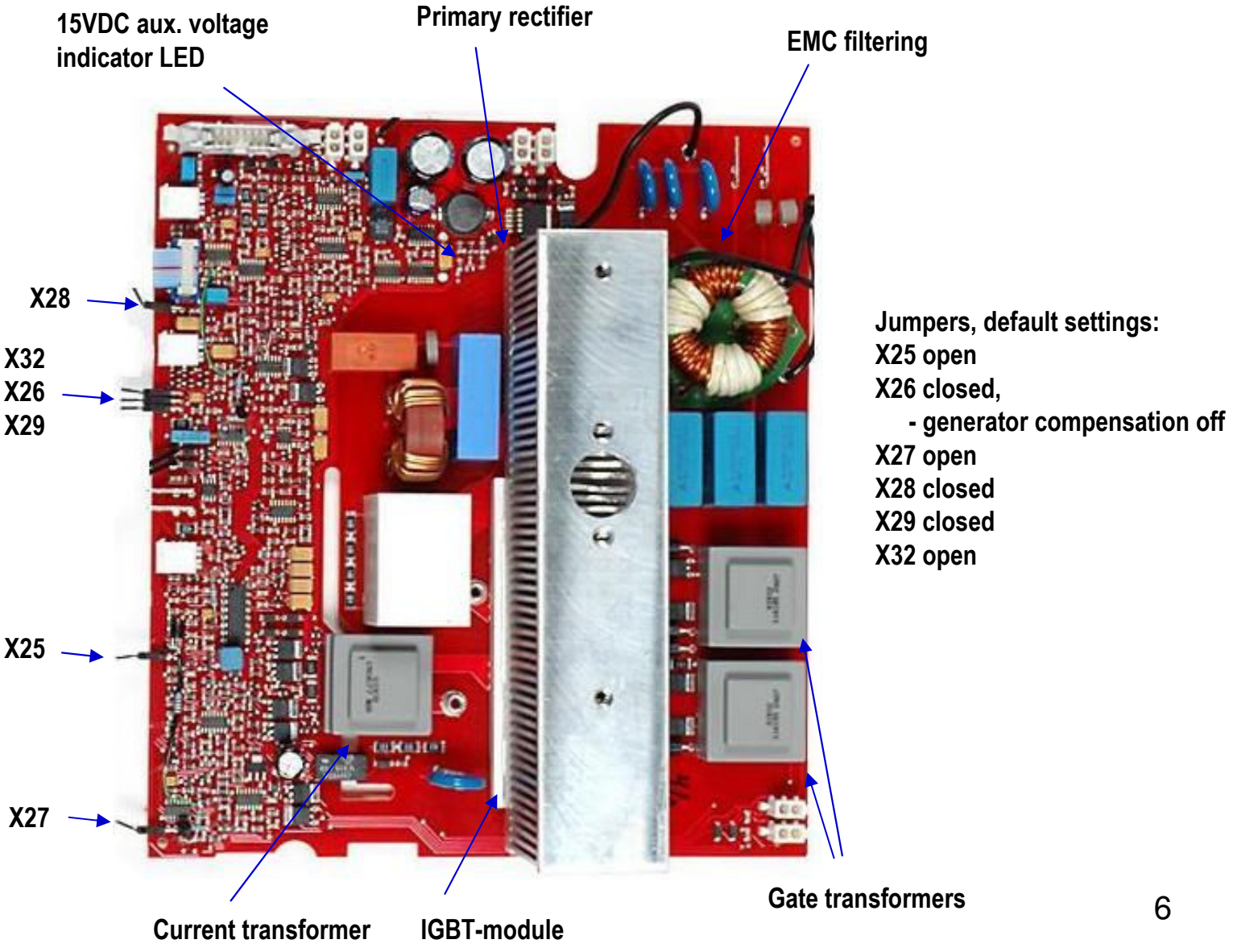
Main circuit diagram



Main circuit card Z001

Functions and components:

- EMC filtering
- Primary rectifier and DC -link charging PTC
- H –bridge (frequency 27kHz)
- Gate transformers and gate drivers
- Auxiliary voltage 15VDC
- Over voltage sensing from DC-link
- Two stage fan start
- PTC protection alerts (signals comes from the main transformer and the secondary choke)



Jumpers, default settings:
X25 open
X26 closed,
- generator compensation off
X27 open
X28 closed
X29 closed
X32 open

Main circuit card Z001

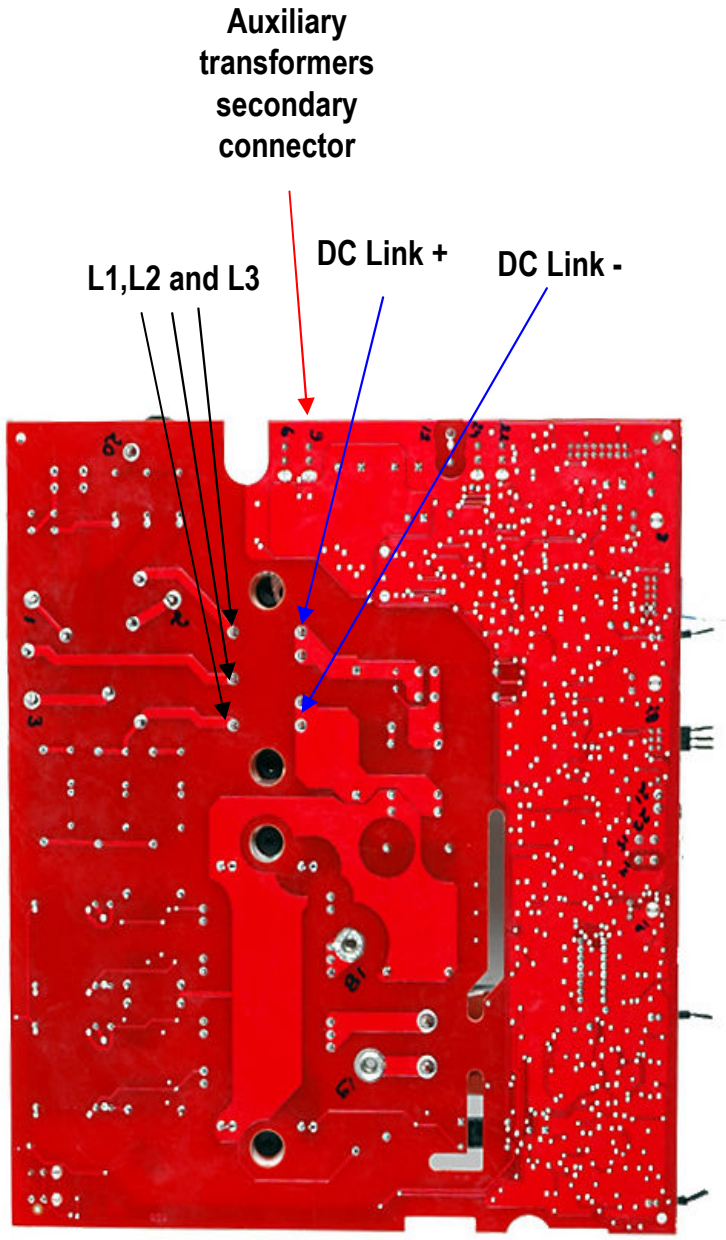
Measurement points

DC-link voltage (with Kemppi multipower): digital multimeter

1. Feed 22 VAC to auxiliary transformers secondary connector from Kemppi multipower (connector must be connected)

2. Measure value from DC-link test points by digital multimeter
   Value: 500 VDC or more

3. Measure secondary voltage (start signal needed)
   Value: 30VDC or more



Primary rectifier: Digital multimeter diode test

1. Red test probe L1, L2, and L3 (one at the time)
   Black test probe DC-link plus
   Value: 0,3 - 0,5 VDC -> diodes ok

2. Red test probe DC-link plus
   Black test probe L1,L2 and L3 (one at the time)
   Value: No value -> diodes ok

3. Red test probe L1, L2, and L3 (one at the time)
   Black test probe DC-link minus
   Value: No value -> diodes ok

4. Red test probe DC-link minus
   Black test probe L1,L2 and L3 (one at the time)
   Value: 0,3 – 0,5 VDC -> diodes ok

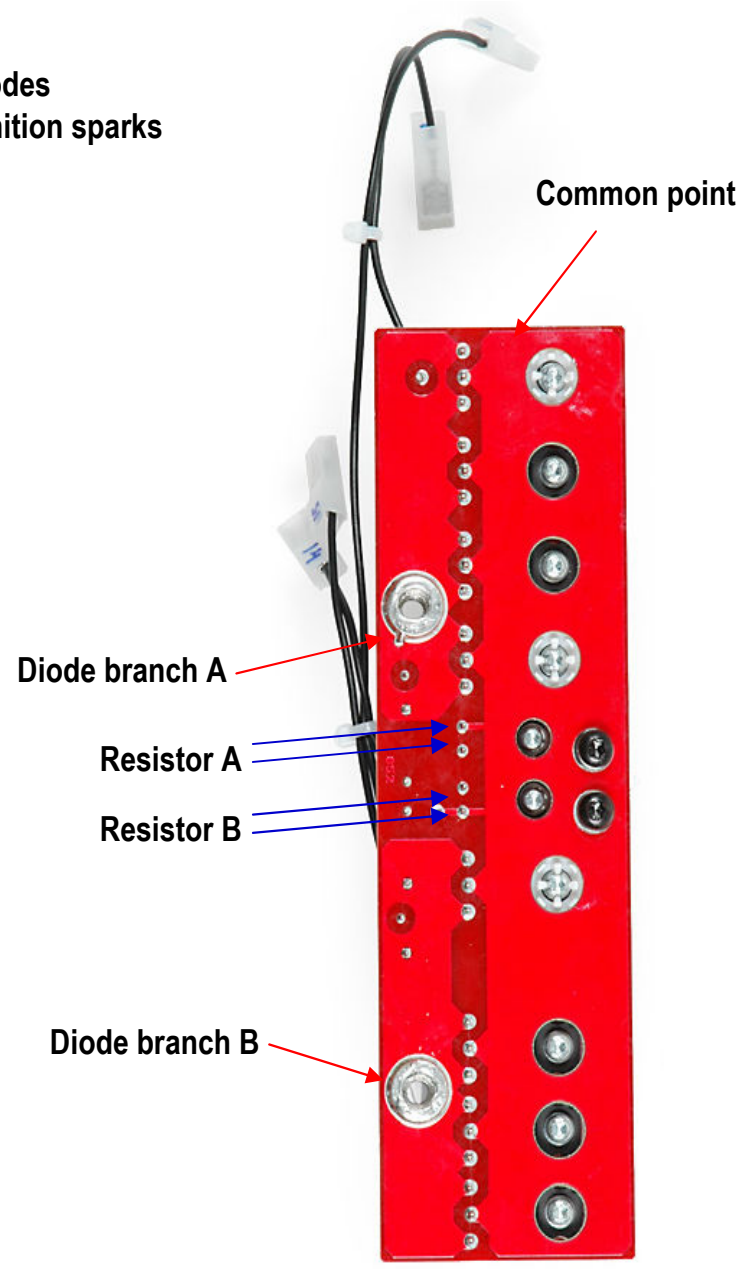
If values in test 1 or 4 are close to zero rectifier is short circuited. If value is “no value” circuit is open

If values in test 2 or 3 are close to zero diodes are leaking

Secondary rectifier Z002

Main components

- Middle point connected full wave rectifier
- Damping circuit reduces voltage stress of diodes
- Overvoltage varistors protect diodes from ignition sparks



Measurement points

Secondary diodes:

1. Measure diode branches one at the time from transformer (red test probe) to common point (black test probe)

   Values: 0,3 – 0,5 VDC

2. Measure diode branches one at the time from common point (red test probe) to transformer (black test probe)

   Value: No value

Damping circuit resistors:

Resistor value must be 5Ω

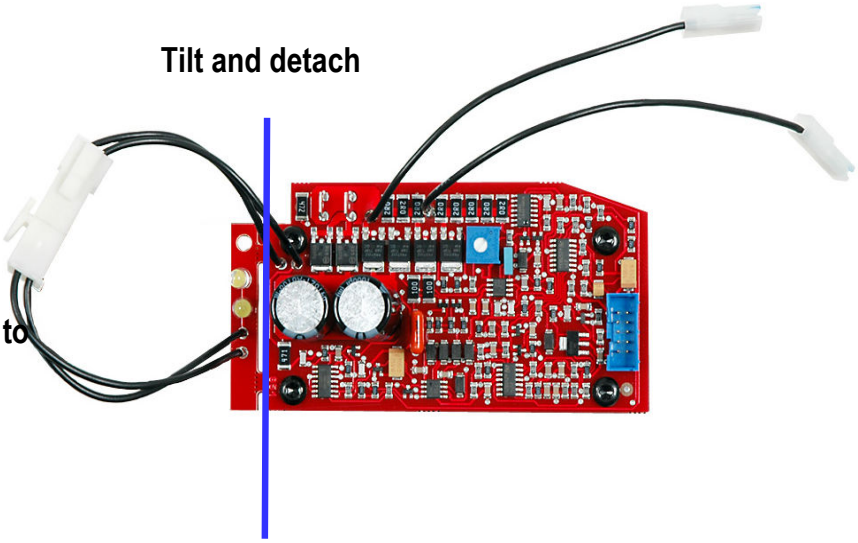
Wire feeder motor control card A001

Functions

- Wire motor power feeding from machine's secondary circuit by MOSFET half bridge
- Wire feed speed maximum adjustment by trimmer
- Spool room light (in different small card)

NOTE!
- When installing spare part card you have to check wire feeding speed maximum adjustment level
- Before installing tilt and detach spool room light card

Tilt and detach



Adjustments

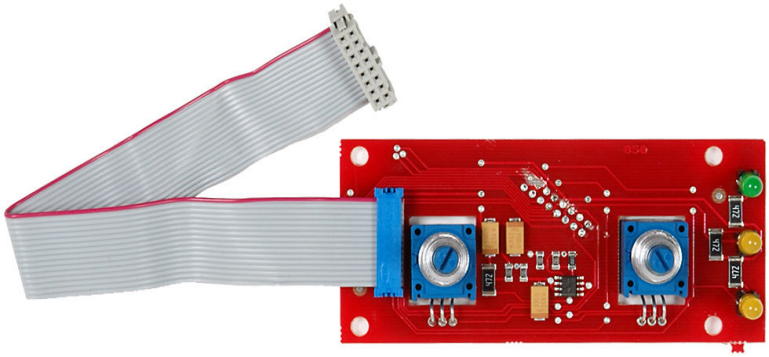
Wire feed speed maximum:

1. Adjust wire feed speed potentiometer to maximum
2. Feed wire 10 second by triggering the torch
3. Measure fed wire length
4. Should be 16,7% of 18m/min (3m/min)

- If wire feed speed is offset, adjust trimmer and repeat steps 2.-4.

Panel card P001

Functions



- Supply voltage 24VDC filtering
- Generating reference voltage 3,3VDC
- Voltage adjustment by potentiometer
- Wire feed adjustment by potentiometer
- Start signal throughput (for optional usage)
- Three leds: On, Overheat protection and No gas

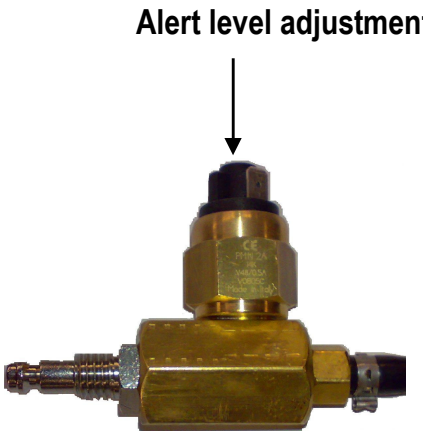
Gas pressure switch S002

Functions

- Prevent welding while gas pressure under adjusted level
- Adjusted to 1 bar as a default
- Not functioning in gasless wire mode

Adjustment

1. Connect gas hose to gas connector
2. Adjust pressure to 1 bar
3. Adjust pressure switch alert level to 1 bar



Installation of semiconductors

IGBT mounting onto the heat sink

The installation surfaces must be clean, even very small particles (0,050mm) between the surfaces increase the gap between heat sink and module, causing module overheating and possibly destruction. Heat transfer paste is spread as an even layer about 0,1 mm thick, onto the modules base plate. The module is immediately attached to the heat sink, in order to avoid any dirt to get between the components. At first all M5 screws are tightened carefully to torque of 0,5…2 Nm, after which the module can be tightened to the nominal torque of 3 Nm. After a few minutes the screw torques are checked again to be 3 Nm.

Secondary diode unit

As described above but screws are torx T-10 and tightening torque 1,2 Nm. Diodes can be tighten right away to this torque.

Notes